

SCAN OPTICS

USER

MANUAL

SO-5000W

SO-5100W

OPHTHALMIC

MICROSCOPE



*SO-5100W Microscope*

*SO-5000W Microscope*

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INTRODUCTION

Please read the following information carefully before installing and using the Scan Optics ophthalmic microscope. Scan Optics is responsible for the safety, reliability and performance of the equipment only if it is used in accordance with these instructions.

This microscope is designed for use by a certified practitioner, for magnified observation of patients, and for use in an operating theatre as an observation aid during surgery. A sample of this product has tested as compliant to IEC 60601-1 for use at 110V and 200-260V, 10-40°C, and 60-95% relative humidity.

Environmental storage and packing conditions of 60-95% relative humidity and 10-40 °C, are recommended for this product.

No parts or accessories supplied with this microscope are supplied in a sterile condition.

Apart from those identified in the instructions within this manual, there are no user-serviceable parts in this microscope. Scan Optics will retain the discretion to advise whether any repairs may be taken out by external qualified technical personnel, or whether part(s) of the microscope must be returned to the manufacturer's premises for service or repairs to be carried out under warranty or otherwise. Where appropriately qualified technical personnel are identified by a user, and ratified by Scan Optics, then Scan Optics will make available on request any information which may assist in maintaining or repairing this equipment.

PARTS LIST
MAIN ASSEMBLIES*Clamp and power supply assembly**Arm assembly**Microscope head assembly**Foot control assembly*

PARTS LIST (CONT)**OTHER**

Focus sterilisable covers (2)



Handle sterilisable cover (2)

Plain eyepiece (1)
Focusable eyepiece (1)

Spare main lamp (1)



Spare auxiliary lamp (1)



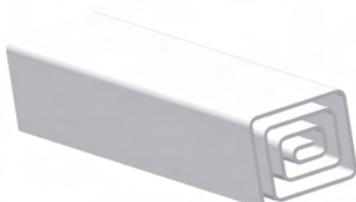
Lens cloth (1)



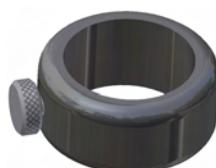
Socket keys (set 7; 1.5,2,2.5,3,4,5,6mm)



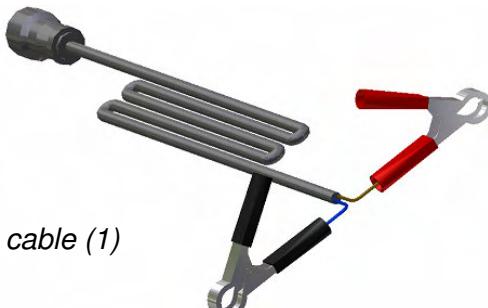
Guide handle and screw



Dust cover(1)



Safety clamp (1)

User manual (1)
(this manual)

Battery cable (1)

PARTS LIST (CONT)
FLOOR STAND (SO-5000 ONLY)*Base (1)**Pillar (1)**Clamping plate (1)**Clamp knobs (2)*

OPTIONAL ACCESSORIES**SCAN OPTICS PART NUMBER****BINOCULAR ASSISTANT MICROSCOPE**

SO-1440

VIDEO SYSTEM

(large and small monitor versions available)

SO-1350

OTHER ACCESSORIES

| | |
|--------------------------------------|---|
| Table plate | SO-291 |
| Spare pair focus sterilisable covers | SO-545 |
| Spare pair zoom sterilisable covers | SO-546 |
| Spare handle sterilisable cover | SO-547 (<i>fits guide or side handle</i>) |
| Side handle | SO-572 |

UNPACKING INSTRUCTIONS

ALUMINIUM CASE

Scan Optics aluminium transit cases provide the best protection for a microscope where it is likely to be transported to more than one location. These transit cases are fitted with polyurethane-polyetherfoam which houses the individual microscope subassemblies and provides excellent durability.

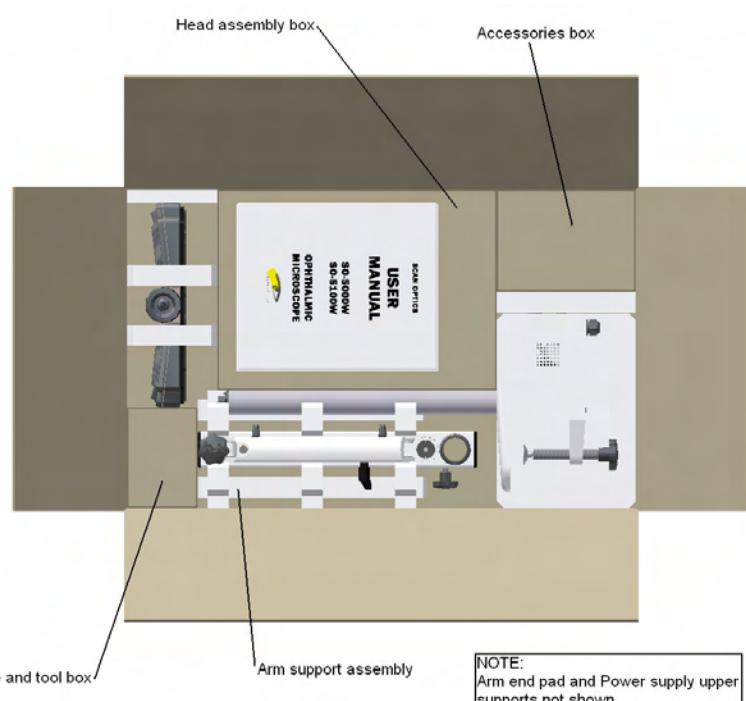
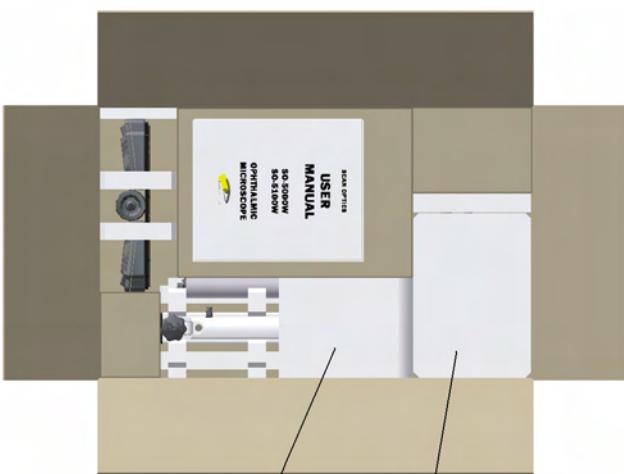
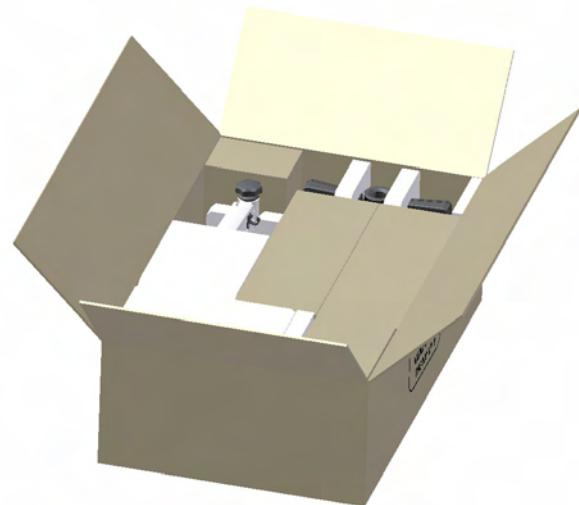


NYLON CASE

As an alternative, microscopes can also be packed in a reinforced nylon suitcase which is indistinguishable from normal luggage. These cases are also fitted with polyurethane-polyetherfoam, and are lighter than aluminium cases.

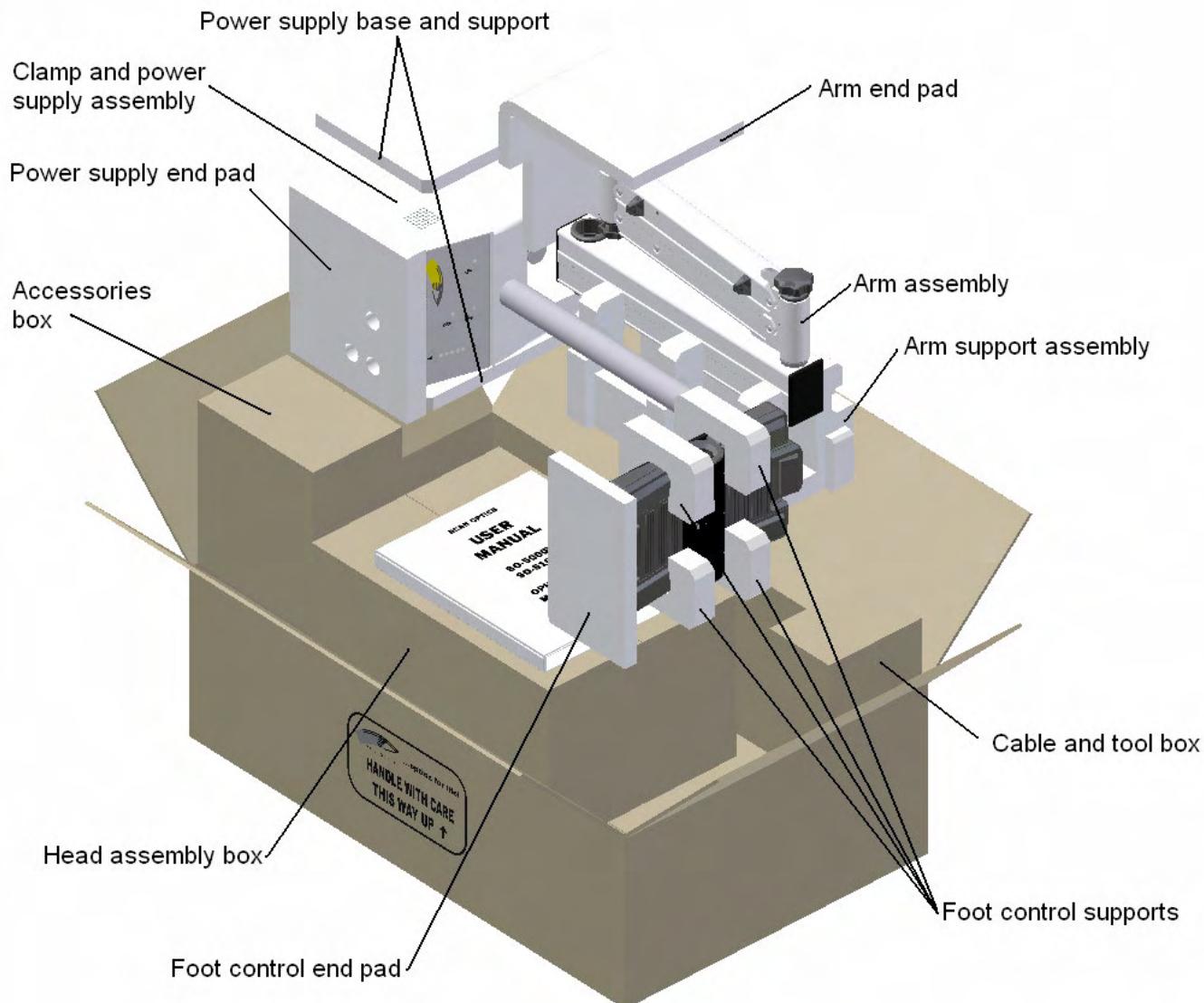
STANDARD PACKAGING

Where microscopes are unlikely to be transported to more than one location, the standard packaging provides solid protection within a double-walled corrugated carton. Polyethylene foam inserts are provided to protect the contents of the carton. Please do not dispose of these packaging materials, but retain all the packaging within the carton for future use. Retain the microscope head assembly cushions within their box.



RE-PACKING

If the microscope is to be stored or transported, it is recommended that the original packaging be re-used for this purpose. If possible, re-pack each assembly in its original plastic bag. The best storage location is a low humidity, dust-free environment, such as an air-conditioned room.

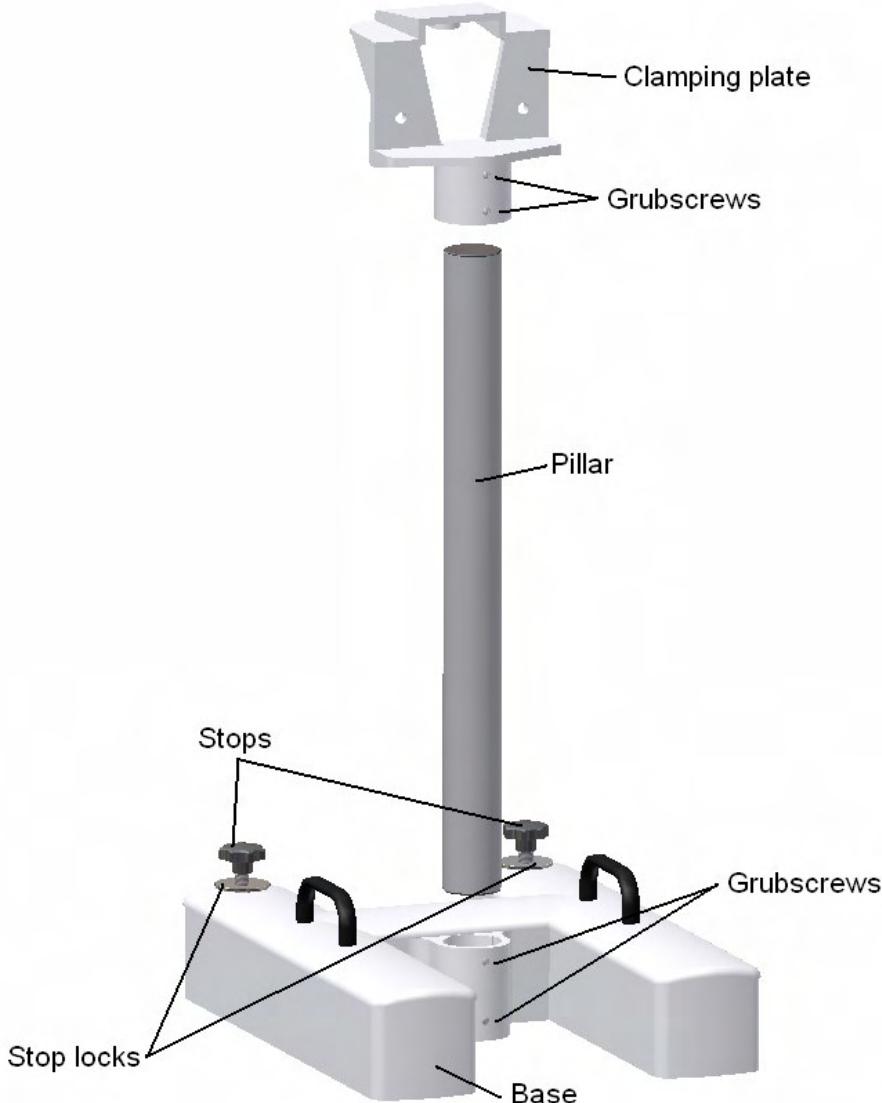


The head assembly box contains an upper and lower moulded cushion which support the head assembly. Retain these cushions within the box for future use.

ASSEMBLY INSTRUCTIONS

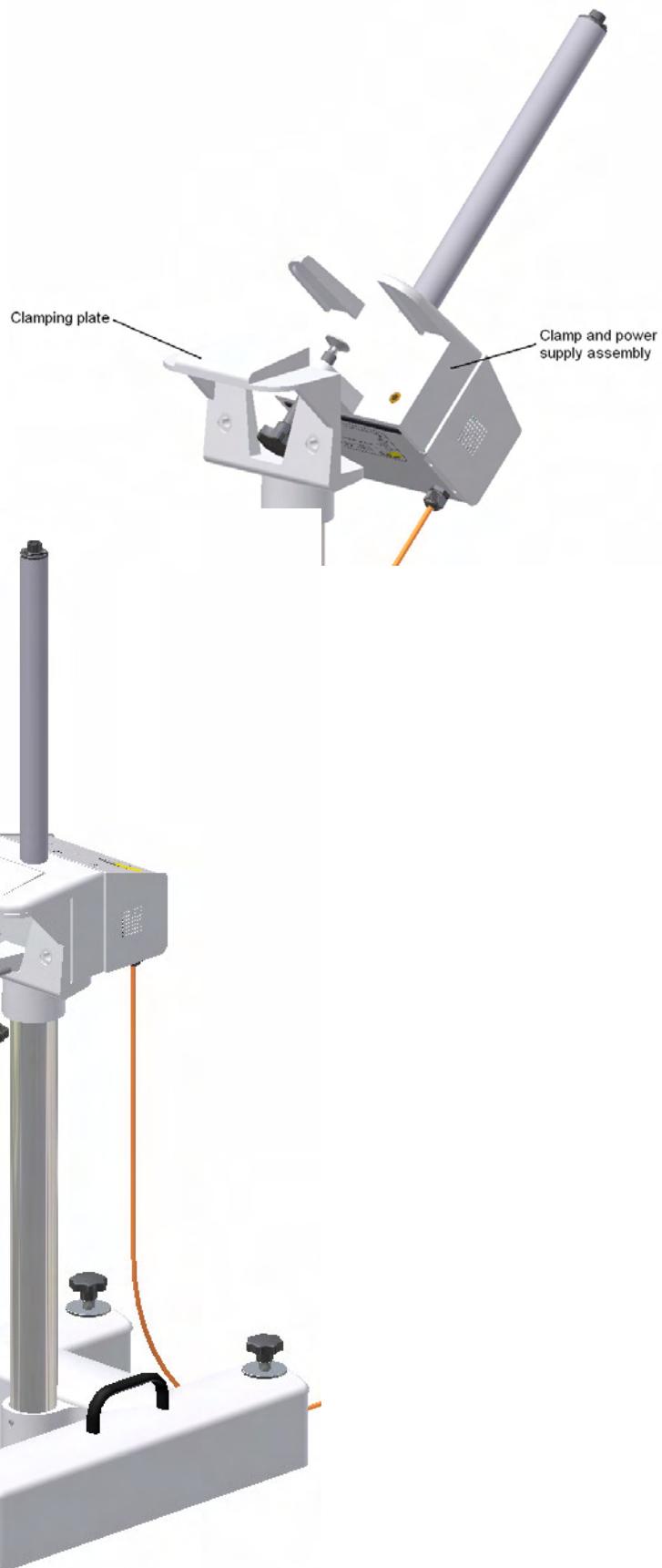
FLOOR STAND (SO-5000 ONLY)

1. Remove the pillar, base and clamping plate from the case or carton.
2. Insert the pillar into the hole in the base. Tighten the two grubscrews using the 5mm socket key found in the tool kit to fix the pillar in place
3. Remove the clamping plate from the case or carton and place it on the pillar. Tighten the two grubscrews to fix the clamping plate in place.
4. To fix the floor stand, screw the stop knobs down until the stops are resting evenly on the floor.
5. Screw the stop lock discs down on to the base to lock the stops.
6. To unlock the floor stand, screw the stop locks back up, then unscrew the stop knobs until the wheels can move freely.



MICROSCOPE**Fixing to the floor stand (SO-5000 ONLY)**

1. When attaching the clamp to the floor stand, tilt the clamp backwards to allow it to fit through the hole in the clamping plate.
2. The floor stand is clamped vertically to the main clamp assembly at one point vertically and at two points horizontally. First tighten the main clamp firmly then use the two clamp knobs provided to fix the clamp horizontally to the clamping plate mount.

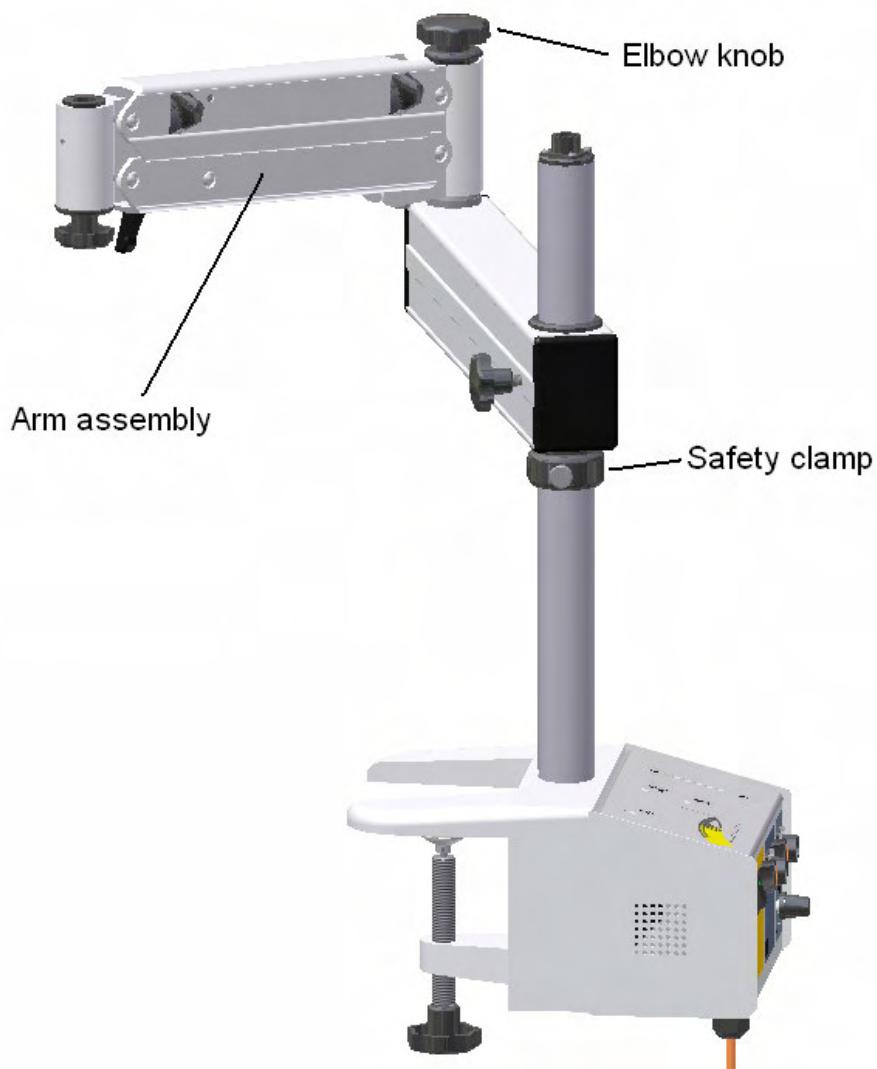


Fixing to a table

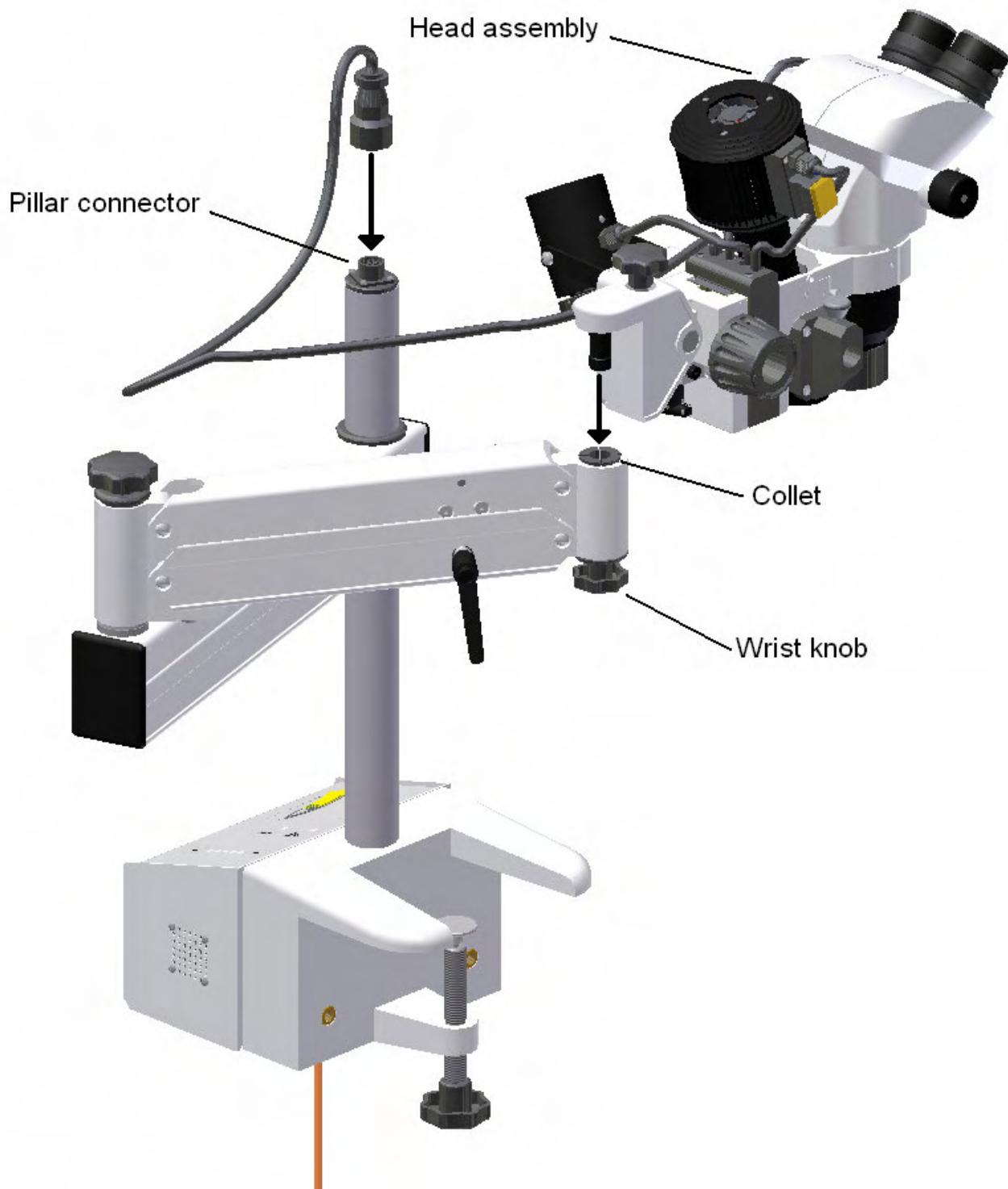
1. Fix the clamp to the operating table about 40 cm from the head of the table. The clamp may be fixed on either side of the table. Make sure that the clamp is pressed firmly against the side of the table before tightening.
2. Alternatively, the clamp may be mounted on any horizontal surface that can be positioned within 60 cm of the working position, such as a mobile trolley.
3. It is important that the mounting surface be free from vibration and movement. Note that in cases where the mounting surface is not rigid, over-tightening of the vertical clamp will not improve microscope stability. In this case, add a stiffening plate (such as Scan Optics Table Plate; Cat No. SO-291) beneath the mounting surface and apply the clamp over the stiffening plate and the original mounting surface.

Assembling the arm and head

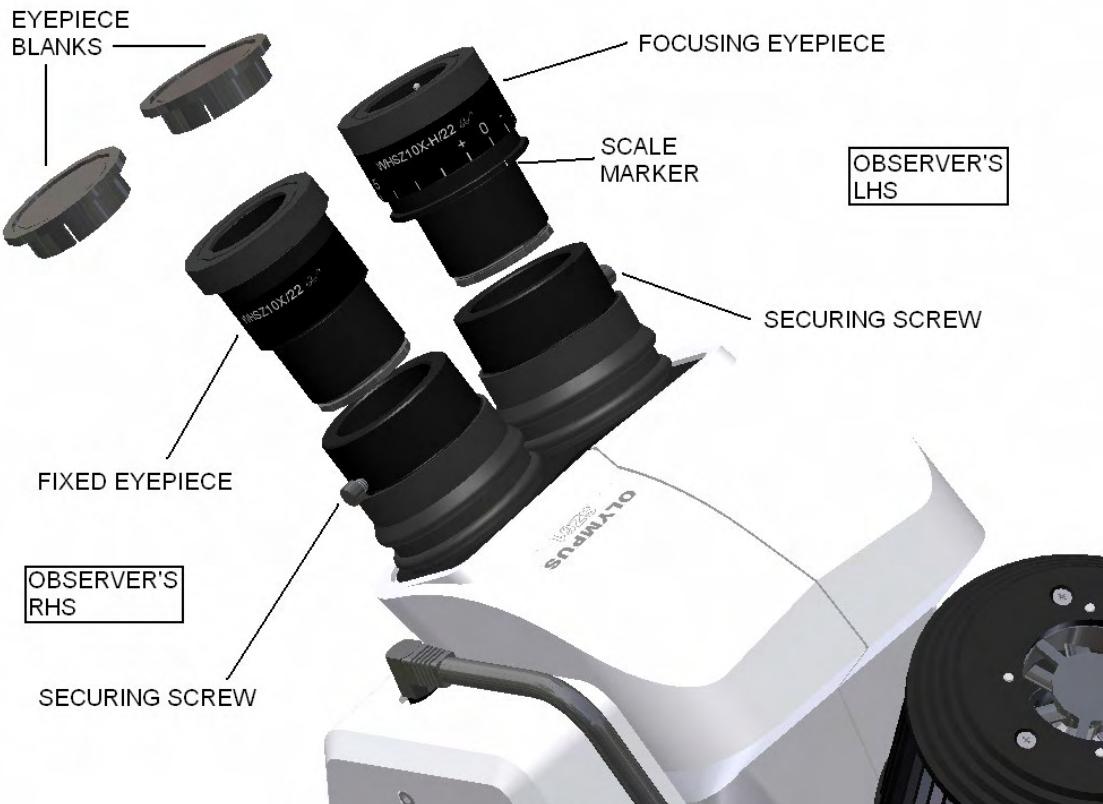
1. Locate the pillar safety clamp and place it on the pillar if it is not there already. Tighten the pillar safety clamp at a point midway up the pillar.
2. Place the arm assembly on the pillar. Make sure that the arm assembly rests against the pillar safety clamp. Loosen the elbow knob to allow the pantograph arm to rotate about the elbow joint.



3. Locate the microscope head assembly in the end of the arm assembly. Make sure the microscope assembly is seated all the way down in the collet. Tighten the wrist knob underneath the end of the arm assembly to secure the microscope in the collet.
4. Pass the cable through the clips on the arm assembly and attach the plug to the connector on the top of the pillar. This will ensure the cable does not obstruct the surgeon or come into contact with the sterile area.



5. Remove the eyepiece blanks and insert the eyepieces. Insert the focusing eyepiece in the LHS eyepiece tube from the observer's perspective and secure in place so that the scale marker is easily visible. Place the fixed eyepiece in the RHS eyepiece tube and secure using the screw. Retain the eyepiece caps in a safe place for when storing the microscope.



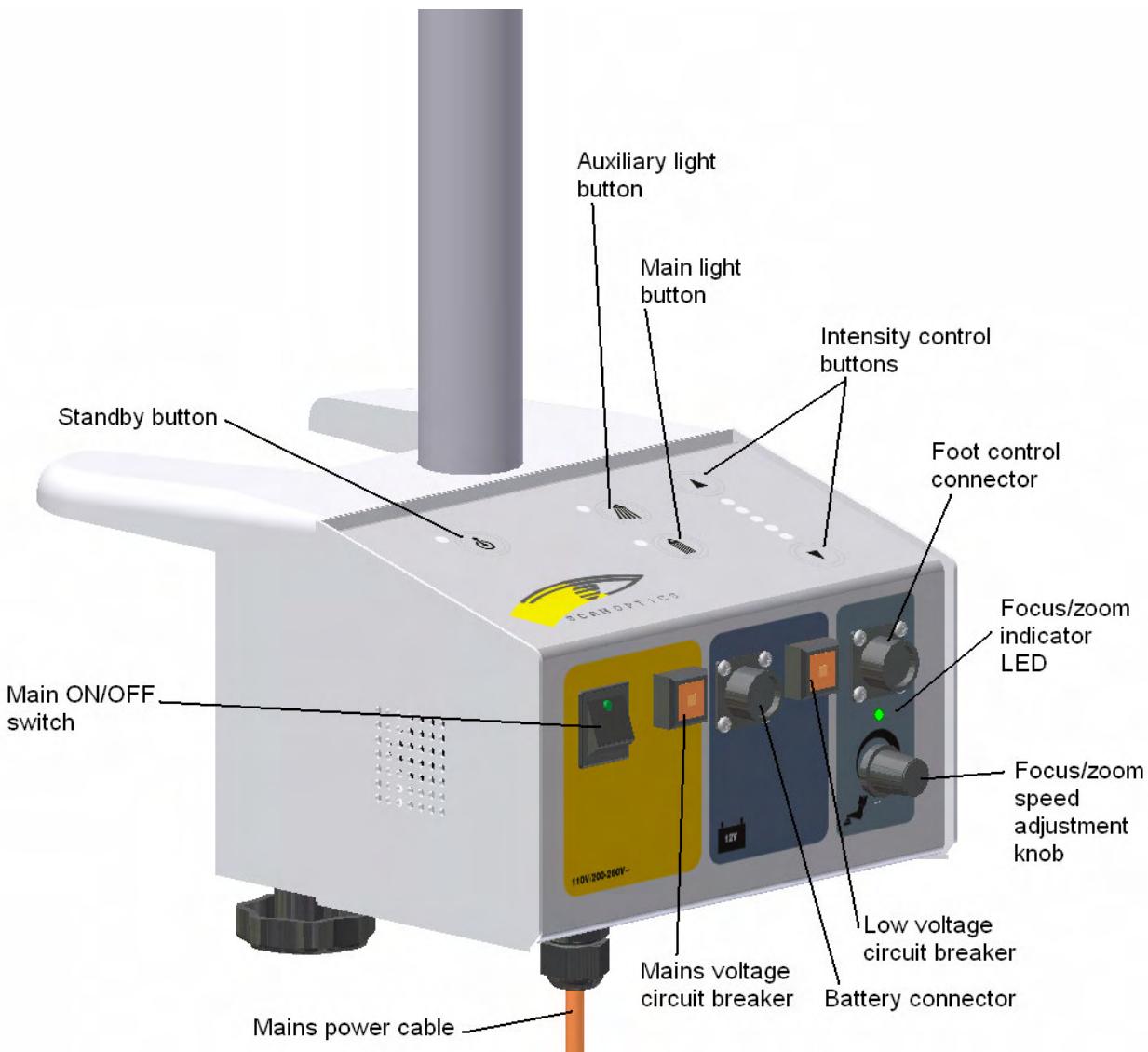
6. If desired, attach the guide handle to the threaded hole at the front of the microscope using the M5x8 socket head cap screw supplied. The guide handle provides a convenient means for manoeuvring the microscope.



Connecting to a power source

The Scan Optics Ophthalmic Microscope may be connected to either an earthed mains (90-260V) ac supply, or a 12V dc supply, or both. The power supply will automatically select the correct mains voltage. If both ac and dc supplies are connected, the dc supply (eg 12V battery) will act as an emergency backup for mains power. In this case, the microscope will not run from battery power unless the mains supply fails or falls by more than 20 percent, or is switched off. If mains power is restored, the microscope will resume using mains power automatically. The mains power switch on the microscope does not switch the battery off.

1. Plug the mains power cable into a mains power socket. International safety standards do not allow the use of an extension cord. **The mains power supply must have a protective earth conductor.** If there is no earth conductor, or if the integrity of the earth conductor arrangement is in doubt, the equipment must be operated from a 12Vdc power source.
2. Switch on the mains power supply at the wall socket. When the ON/OFF switch on the power is selected to ON, the power supply indicator on the switch will light and an audible 'beep' should be heard.



Turning the lights on and off

When the power supply is switched on, it will default to 'standby' mode. In standby mode, the cooling fans are switched on but the lamps are off. In standby mode, the LED indicator next to the standby button will be illuminated.

To turn the lamps on:

1. Depress the standby button once. The standby LED will switch off
2. Turn on the main lamp by pressing the button on the power supply. The main lamp button LED will illuminate and the main lamp will come on after a short delay.
3. Turn on the auxiliary lamp by pressing the button on the power supply. The auxiliary lamp button LED will illuminate and the auxiliary lamp will come on after a short delay.
4. Set the light intensity by toggling the light intensity adjustment buttons, or the central pedals on the foot control. Note that this will simultaneously adjust the intensity of both the main and auxiliary lights.

To turn the lamps off:

1. Press the individual lamp buttons again to switch them off, or press the standby button.
2. If the standby button is depressed to turn the lights off then a second time to turn them back on again, the power supply will default to the last intensity setting used.

Battery operation, maintenance and safety

Scan Optics recommend the use of gel cell or sealed rechargeable lead-acid 12V batteries such as Scan Optics SO-9210 (38Ah capacity). These batteries are maintenance-free and can be operated, charged or stored in any position without leakage.

1. If the power supply is to be connected to a 12-volt dc supply, remove the battery cable from the carton and connect the cable to the 12-volt connector on the middle of the front panel on the power supply.
2. Connect the red battery clip to the positive battery terminal, and the black clip to the negative battery terminal. The power supply will not operate if the terminals are reversed
 - Earthing is not required when a 12-volt supply is used alone.
 - The 12 volt supply must be direct current. The power supply will not operate with 12 volts alternating current.
 - Ensure batteries have adequate airflow around them before charging.
 - Avoid short-circuiting batteries.
 - Old lead-acid batteries of any type must be disposed of correctly. It is recommended that they are recycled by an appropriate establishment who recycle car batteries. Lead acid batteries should not be disposed of with ordinary waste, as lead poisoning or acid trauma may result.

Where battery backup is used, Scan Optics recommends a periodical check of the battery to ensure it is charged and functional.

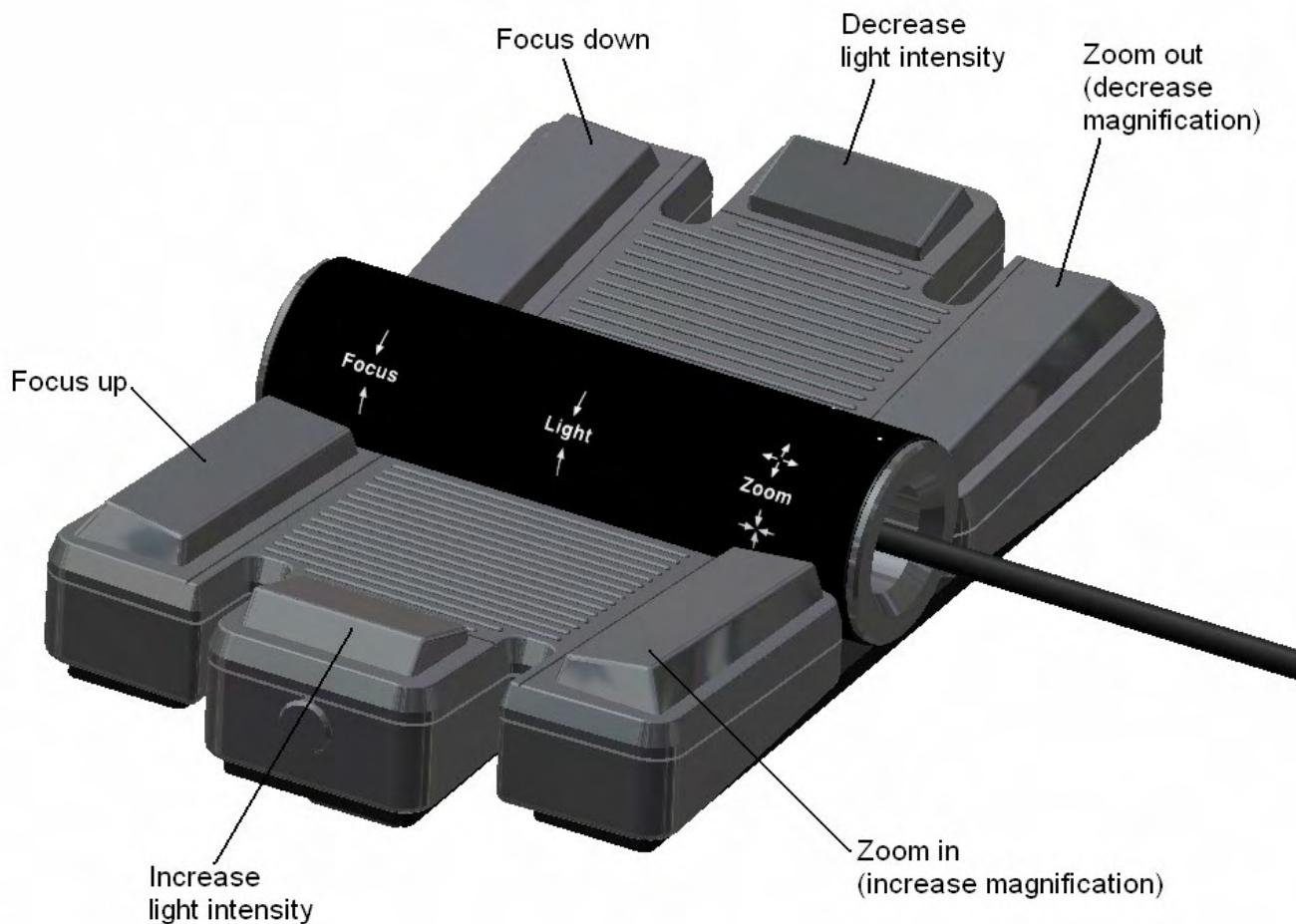
Foot control

The Scan Optics foot control allows control of focus, zoom and light intensity functions.

To connect the foot control, simply plug the cable into the socket on the right side of the front panel of the power supply.

Whenever the foot control is used to control any function, the LED indicator located below the foot control connector on the power supply will illuminate. If there is a problem with foot control function, first check to see if this LED is lighting up when a particular foot pedal is depressed.

Speed of foot controlled focus and zoom operations may be controlled by the knob on the power supply located directly below the foot control connector.



Arm assembly adjustments

The arm assembly includes a number of features which enable the microscope to be adjusted in almost any position. The best combination of settings will depend on the individual user and the particular surgical environment.

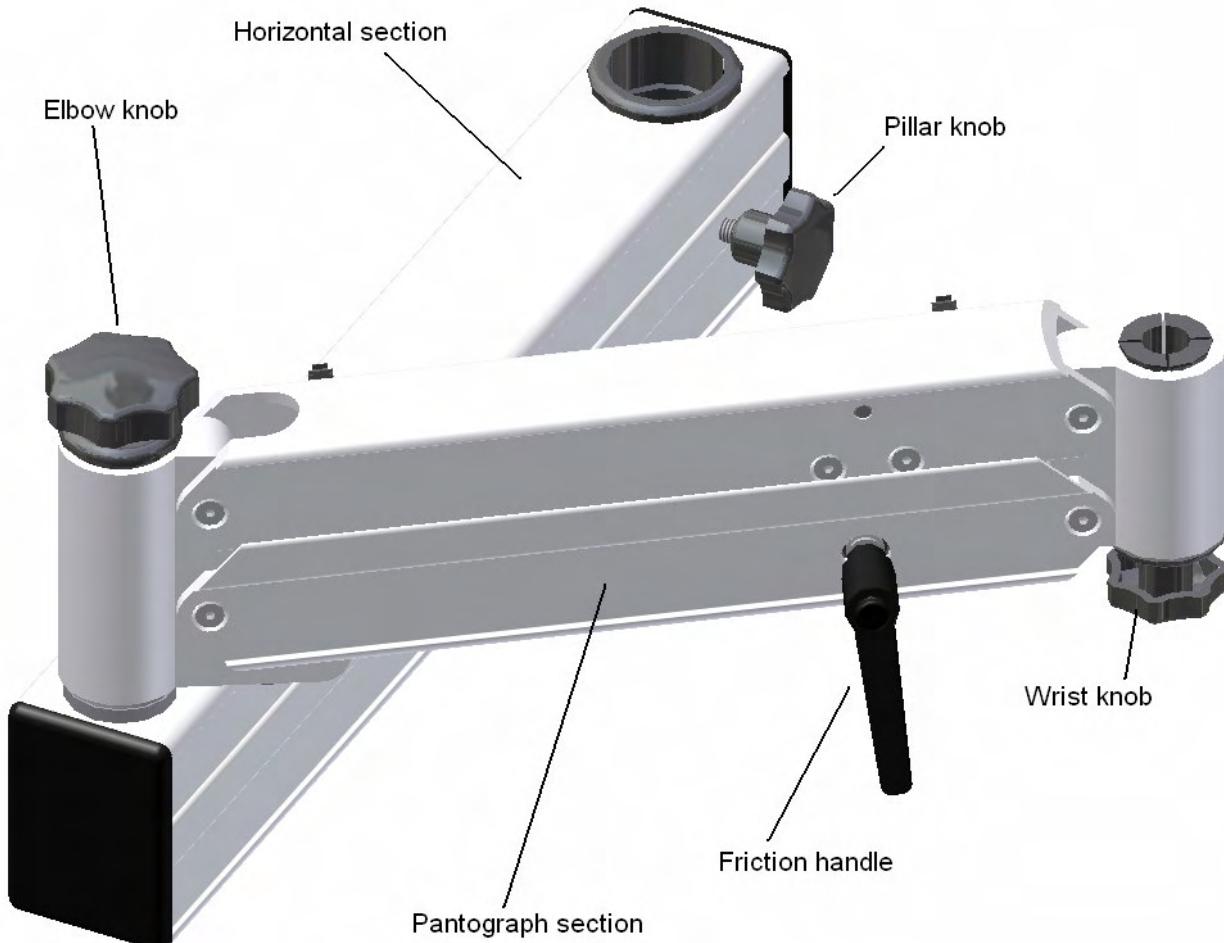
The *pillar knob* allows the arm assembly to be locked in position about the pillar.

The *elbow knob* allows the shape of the arm to be locked in position; that is the position of the pantograph section relative to the horizontal section of the arm assembly.

The *friction handle* allows the vertical movement of the pantograph section of the arm assembly to be restricted or locked in position.

The *wrist knob* allows the head assembly to be locked in position relative to the pantograph section of the arm assembly. This knob should not be unlocked after the head assembly has been adjusted. This will prevent accidental dislodgement of the head assembly when attempting vertical positioning manoeuvres.

In a typical configuration; the pillar knob would be left slightly loose but the elbow and wrist knobs would be locked. **Note that the safety clamp must be in position directly under the horizontal section of the arm assembly for safe operation of the microscope, this will prevent the arm assembly sliding down the pillar.** The friction handle could be set such that when vertical adjustments of the pantograph arm are made, the arm will stay in position after being moved. This will allow the microscope to be swung out of the way about the pillar after surgery while the patient is moved. When the next patient is ready, the microscope can be swung in again and it will already be in a good approximate position.



Gas spring adjustment

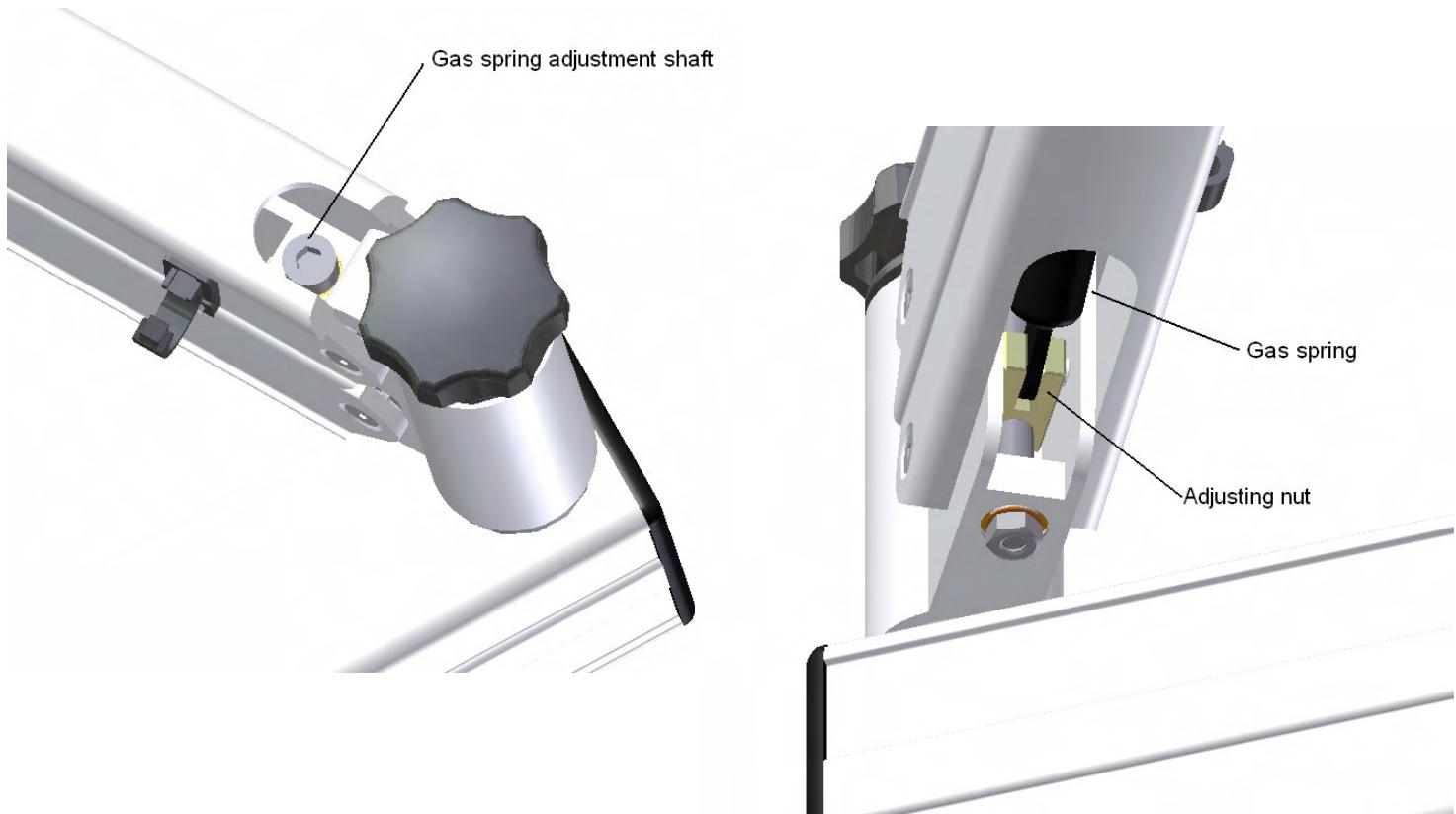
The microscope arm is fitted with an adjustable gas spring. By adjusting the position of one end of the gas spring, the amount of upward force can be changed. Thus if accessories are added to or removed from the microscope, the force setting can be adjusted to compensate for the change in weight, thereby maintaining the same desired 'feel' of the arm movement.

To adjust the gas spring:

1. With one hand, push the pantograph arm down until it is in the horizontal position. This will expose the socket in the adjusting screw.
2. Using the 5mm socket key provided in the tool box, rotate the screw clockwise to move the adjusting nut up and decrease the arm force. Alternatively rotate the screw anti-clockwise to move the nut down and increase the arm force.

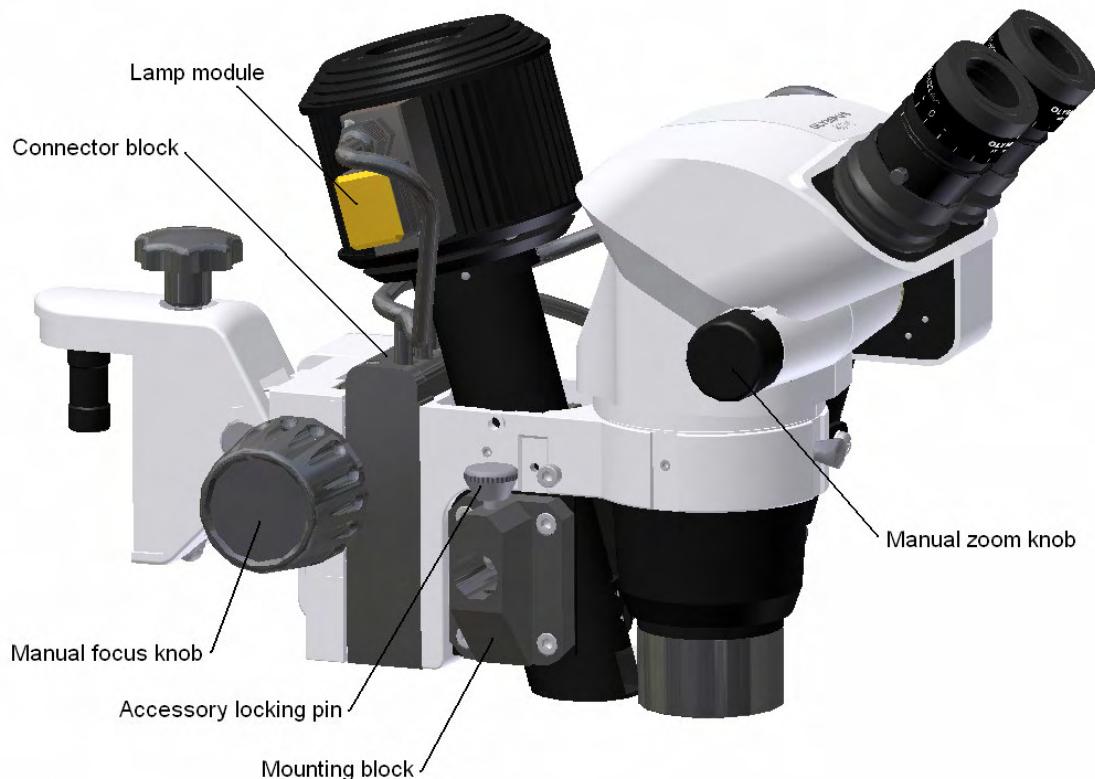
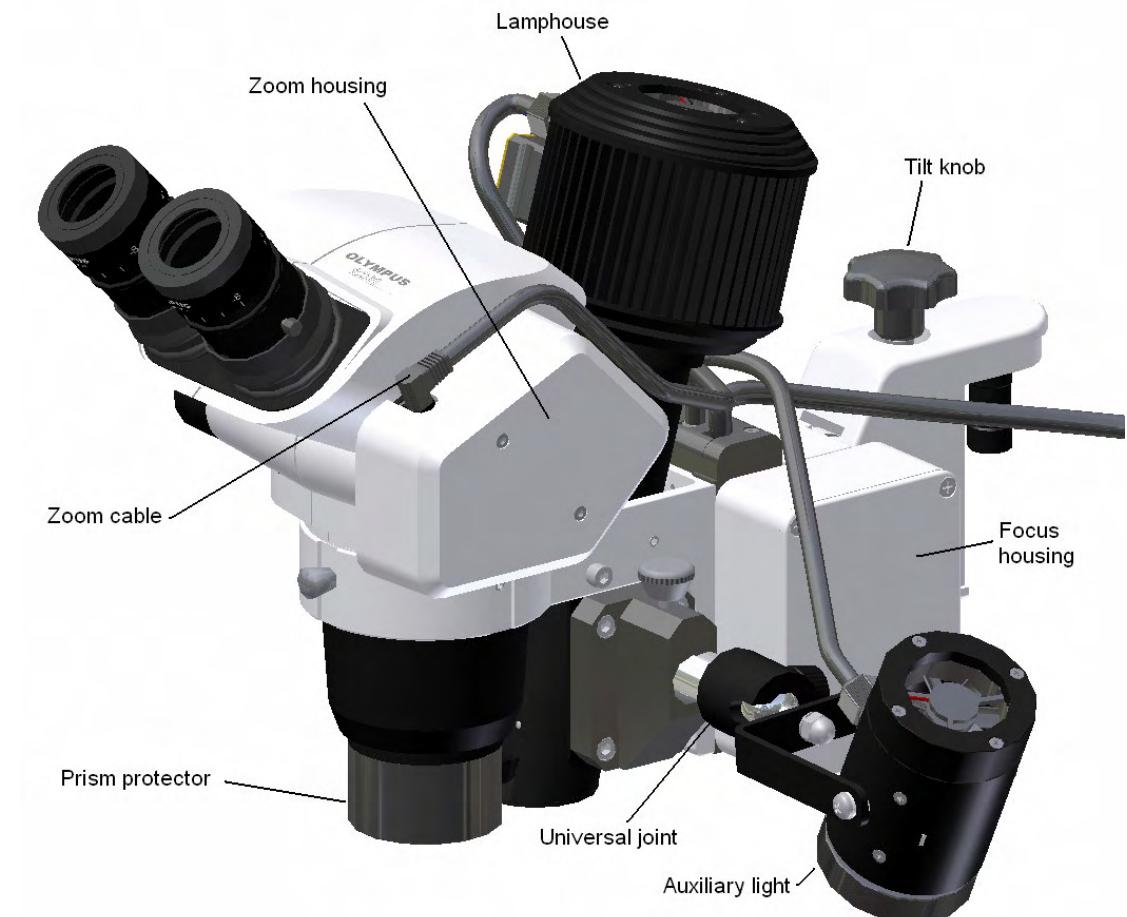
CAUTION:

Always check the arm movement over the entire up/down stroke of the arm. If the microscope is heavily loaded with accessories and the arm force is set too low, the arm may drop suddenly if it is not adequately restrained with the friction lock.



Microscope head assembly

A good working knowledge of the microscope head assembly will be of great assistance in achieving and maintaining optimum optical and mechanical performance.



USING THE MICROSCOPE

Sterilisation

Scan Optics microscopes are supplied with two sets of sterilisable covers – one set may be used while the other set is undergoing sterilisation. Additional sterilisable covers may be purchased from Scan Optics in the event of loss or damage.

The covers may be sterilised by:

- boiling
- autoclaving
- chemical sterilisation
- gas sterilisation.

Note that national authorities may require the use of specific sterilisation or disinfection methods.

Moving the head into position

Note that sterilised covers should be applied to the manual focus and zoom knobs and the guide handle (if used) before these parts of the microscope are touched by a sterile operator.

1. Move the head into approximate position using the arm assembly articulations.
2. Use the foot control to move the microscope focus up to the half-way position. This is indicated by the two black dots on the left hand side of the microscope head, and will leave approximately 25mm of movement up or down from the central position.
3. Use the manual focus knob or optional side handle to move the head up or down while looking through the eyepieces to roughly focus the microscope.
4. If the microscope eyepieces are higher than the most comfortable position for the operator and it is not possible or practical to adjust the operator's seat, rotate the tilt knob clockwise to tilt the head of the microscope down. The range of tilt adjustment is from 45° downward to 5° above the horizontal.

Focussing the microscope

Focussing the microscope in the correct sequence is an important step in setting up for use.

1. Set the pupillary distance of the microscope by moving the eyepieces apart or together as required. The eyepieces are geared together and will move equal distances on either side of the optical centre of the microscope.
2. Set the refractive error scale to zero on the LHS eyepiece.
3. Choose a high magnification zoom setting or one which is typically used in surgery.
4. Close the left eye and look through the right eyepiece of the microscope with the right eye only.
5. Focus the microscope slowly until the image is sharply in focus.
6. Close the right eye and look through the left eyepiece of the microscope with the left eye only.
7. Rotate the refractive error adjustment ring on the left eyepiece until the left eye is in focus. The reading on the ring will give an approximate measure of the relative refractive error between the left and right eyes.
8. Look through both eyepieces normally and check that the image is focussed and that stereopsis is achieved.

Setting the auxiliary light

The auxiliary light may be used for general illumination of the surgical area or alternatively for illumination of the instrument tray. To adjust the position of the auxiliary light, loosen the clamp knob which is located underneath the universal joint. Hold the auxiliary light with one hand and manoeuvre the light until it is pointing in the desired direction. Tighten the clamp knob firmly.

Tilt function

To tilt the head assembly up or down, simply rotate the tilt knob anti-clockwise or clockwise accordingly. Note that the entire head assembly will tilt, not just the eyepieces. To ease this operation, support the weight of the microscope head with one hand while using the other hand to rotate the knob.

Zoom function

To zoom the image in or out, depress the appropriate foot control pedal. The total zoom range is between 4x and 25x magnification. Sterilisable covers are provided for fitting over the manual zoom knob when sterile use is required.

Focus function

To focus the microscope up or down, the appropriate foot control pedal. The total focus range is 50mm. For optimum microscope use, leave the microscope head in such a position to allow approximately 25mm of focus range in each direction. Sterilisable covers are provided for fitting over the manual focus knob when sterile use is required.

Manual mode

If the manual controls are to be used (for example where no power is available) first disconnect the foot control. This will significantly reduce wear on the focus and zoom motors, and enable easier turning of the manual focus and zoom knobs.

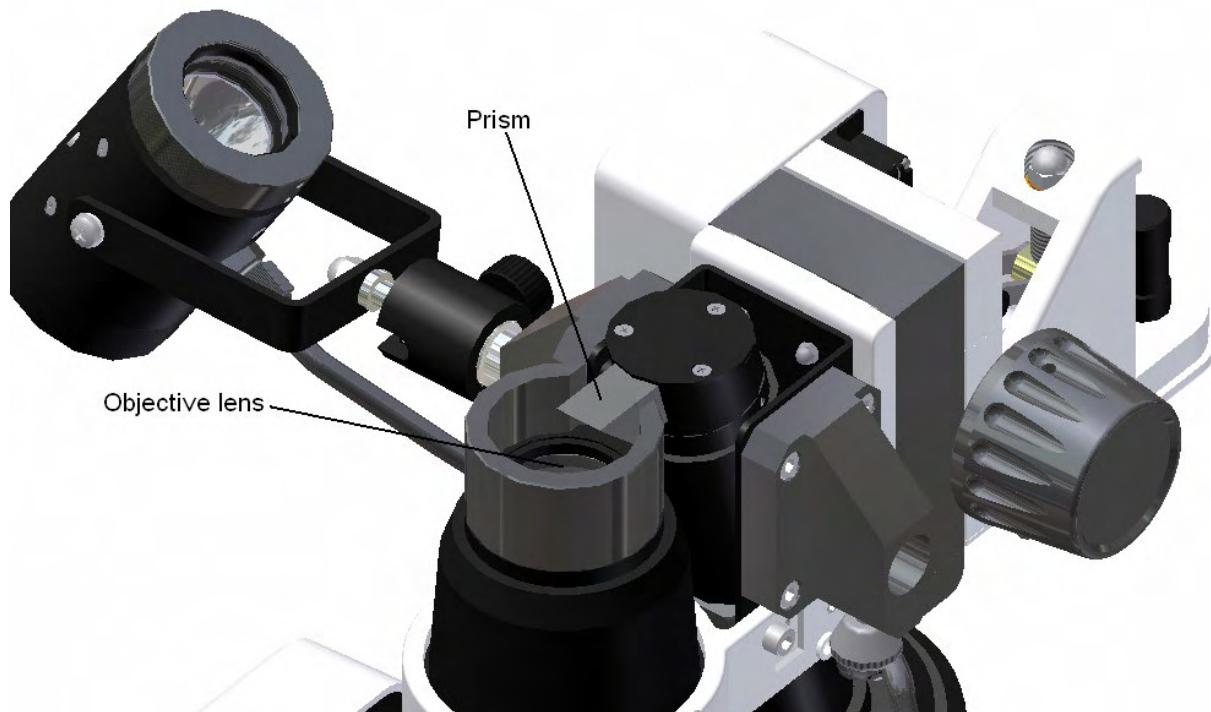
ROUTINE CARE AND MAINTENANCE

OPTICAL HEAD

Cleaning the optical components

The eyepieces, objective lens and lamphouse prism should be checked for cleanliness each time the instrument is used. Surface dust should be removed with a clean, soft brush. Fingerprints, irrigation solution residue and grease may be removed by lightly wiping with a cotton cloth or lens tissue moistened with a mixture of 70% ether and 30% absolute alcohol (either ethanol or methanol). Use pure alcohol if no ether is available.

Do not use acetone as it may damage the surface coatings of the lenses.



Cleaning the plastic parts and paintwork

Use water based cleaners only.

Do not use any organic solvent such as alcohol, ether or xylene.

Do not dismantle

Apart from instructions specifically mentioned within this manual, no parts inside the optical head of the instrument can be serviced by the user. Attempts to dismantle the optical head or prism cover will make any warranty void.

Protection against mould

In hot and humid climates it is common for mould to grow on optical surfaces. Cleaning and repairing the damage can be expensive and inconvenient. To minimise the risk of mould forming, do not leave the instrument without either eyepieces or eyepiece blanks inserted and always store the optical head in a sealed bag containing silica gel desiccant. Scan Optics SO-5000W and SO-5100 microscopes are fitted with anti-mould protection. In tropical climates, routine checking for the presence of mould is recommended.

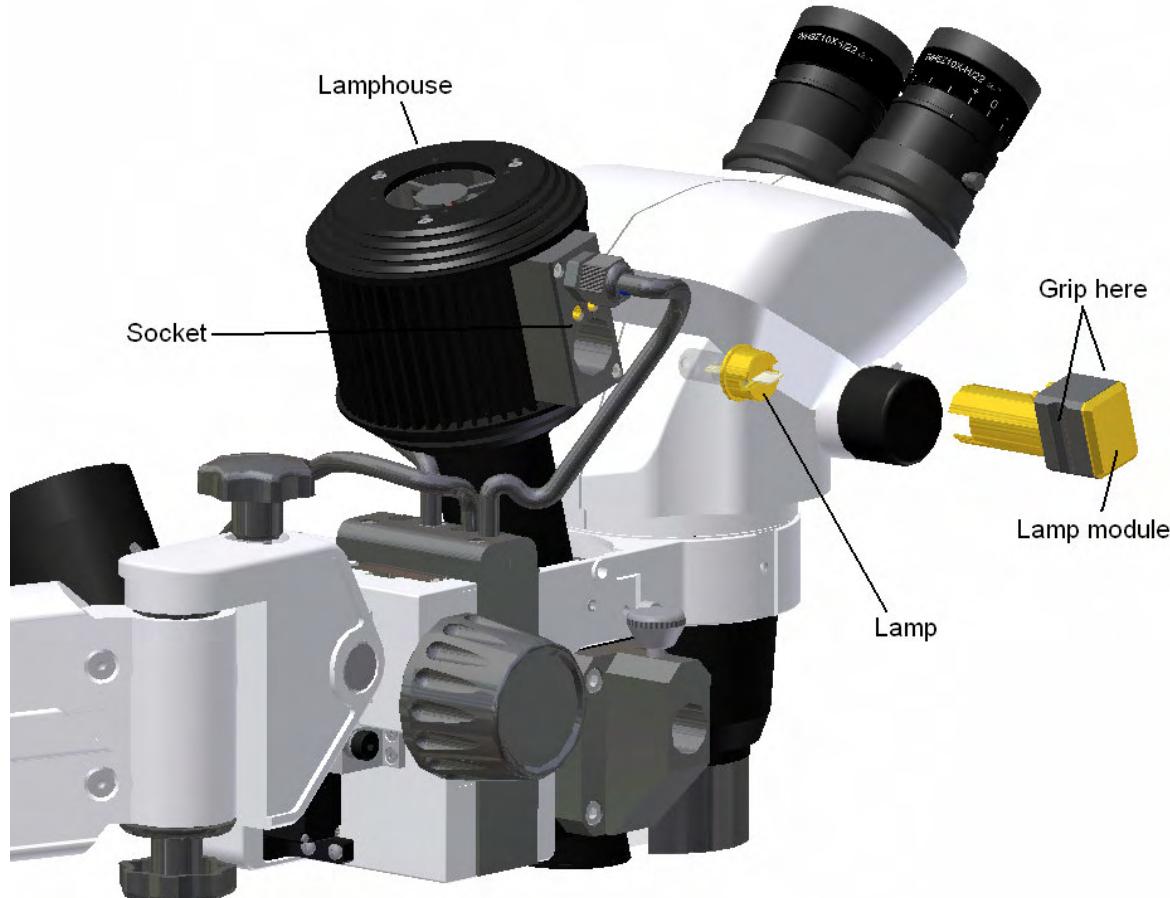
LIGHTING SYSTEM

Lamp life

The main lamp supplied has a rated average life of 50 hours; however the actual life of the lamp will depend on the intensity setting normally used. The highest setting is an over-run setting which increases light output but will reduce lamp life to about 20 hours. Conversely, running the lamp at the next lowest setting will produce a lamp life of about 60 hours. It is strongly recommended that the lamp be replaced as a routine maintenance task, to reduce the possibility of failure during surgery.

Replacing the main lamp

1. Always use protective gloves while replacing the lamp as lamp temperatures may be sufficiently high to burn skin should it come into contact with the quartz capsule. Where possible, allow the lamp to cool before replacing it. Ensure that the new lamp is free of grease or finger prints before replacement. Any such marks should be removed with a solvent such as ethanol to avoid reducing lamp life.
2. First grip the lamp module located beneath the cable gland on the side of the lamphouse. Pull the lamp module out to reveal the lamp.
3. Grip the lamp at the side of the gold section where the rectangular cut-out is located, and pull the lamp out of the lamp module. **Do not attempt to pull the lamp out by gripping the quartz capsule.**
4. Push the new lamp into the lamp module so that the lamp flange sits flush on the front of the gold tube section. Replace the lamp module in the socket in the lamphouse, so that the pins 'click' into place. Correct lamp replacement using this method is essential for ensuring good illumination.



Replacing the auxiliary lamp

1. Turn off the power supply. Note that if the lamp is replaced while it is still hot, protective gloves may be required.
2. Unscrew the filter assembly from the front of the auxiliary light. **Do not undo the grubscrews which hold the filters in place.**
3. The lamp is connected to the lampholder, which is hard-wired back to the connector block. Gently extricate the lamp and lampholder on its lead from the housing, using a flat-bladed screwdriver if necessary.
4. Remove the old lamp from the lampholder.
5. Replace the lamp with one of the exactly the same specifications. If in doubt, contact Scan Optics for a replacement. Push it firmly into the lampholder, ensuring that it is seated squarely against the base. Push the lamp back into its normal position, checking that the wires do not interfere with the fan at the rear of the auxiliary light.
6. Carefully screw the filter assembly back into the housing. The filter assembly has a fine-pitch thread which may be damaged easily if it is inserted incorrectly. Do not force the thread; instead make sure that the filter assembly is being screwed straight into the housing.



ADVANCED INSTRUCTIONS

Replacing mould protection

The microscope is fitted with anti-mould protection which is effective for approximately three years. However, the effective life of this protection will depend on environmental factors such as the temperature and humidity of the place where the microscope is stored. Regular inspection of the microscope will help early identification of mould and alert the user of the need to replace the anti-mould protection.

To replace the anti-mould pellet:

1. Zoom the microscope to the *lowest* magnification setting
2. Loosen the thumbscrews on either side of the microscope head, and disconnect the zoom power cable.
3. Lift the microscope out of the mounting ring
4. Remove the prism protector from the auxiliary objective assembly by prying it apart
5. Unscrew the cover from the bottom of the microscope head. The location of the existing anti-mould pellet will be revealed from the front of the microscope head.
6. Remove the old anti-mould pellet.



7. Peel the adhesive backing from the new anti-mould pellet and place it in the same location.
8. Zoom the microscope in and out all the way to make sure the zoom optics do not dislodge the pellet.
9. Screw the cover back on, ensuring that the anti-mould pellet has not been dislodged.
10. Replace the prism protector on the auxiliary objective assembly, making sure that the slot lines up with the location of the lamphouse prism.
11. Replace the microscope head back in the mounting ring and re-tighten the thumbscrews.
12. Reattach the zoom power cable.
13. Update the anti-mould label on the microscope head, or replace it with a new label.



TROUBLESHOOTING

| | SYMPTOM | FIRST STEP | REMEDY |
|-----------------------|--|---|---|
| VIEWING SYSTEM | The image is blurry | If the microscope or object has moved it may no longer be in focus. | Refocus the microscope and the video camera if necessary. |
| | | A different user may require adjustment for their refractive error. | Adjust the eyepieces for refractive error – refer <i>Focussing the microscope</i> . |
| | | Check the eyepieces for cleanliness. | Carefully remove and clean the eyepieces if they are dirty, then replace them. |
| | | Check the objective lens for cleanliness. | Carefully clean the objective lens, taking care not to damage the lamphouse prism. |
| | No image is seen | Check that the eyepieces have been inserted. | Insert the eyepieces. |
| | | Check for obstructions in the viewing path | Remove the obstruction. |
| | There is less light apparent in the right eyepiece | On microscopes fitted with video systems it is normal for slightly less light to be apparent since a small proportion is diverted to the video camera | |
| FOCUS AND ZOOM SYSTEM | The foot control is not working | Check if the foot control indicator lights up when the zoom or focus pedals are depressed. If the light comes on when the pedals are depressed the foot control is working and the problem is elsewhere | If the light does not come on, check that the foot control is properly connected to the power supply. |
| | The power focus is not working | Check to see if the problem is specific to up or down movement, or a particular part of the focus range | If you are unable to fix the problem or require further advice, contact your distributor, local service agent or Scan Optics. |
| | | Open the focus housing by removing the 4 screws. Check for worn focus gears or gear misalignment. | |
| | Remove the foot control connector and try the manual focus knob. | Check for worn areas on the focus rack which will be visible behind the lamphouse when the microscope is focussed up. | |

| | SYMPTOM | FIRST STEP | REMEDY |
|------------------------------|--|---|---|
| FOCUS AND ZOOM SYSTEM | The power zoom is not working | Check the focus/zoom speed adjustment on the power supply | At very low settings there may not be sufficient voltage to drive the microscope up. Increase the speed. |
| | | Check that the zoom cable is connected. | If not, connect it. If connected, contact your distributor, local service agent or Scan Optics. |
| LIGHTING SYSTEM | The light is too dim | Remove the lamp module and check for blackening or failure. | Replace a blackened or failed lamp. |
| | | Check the intensity setting on the front panel. | Increase the lamp intensity using the foot control or front panel. |
| | There is no light | Check if there is mains power available (green LED on the main switch) | Switch to battery power if no mains power is available. |
| | | Check if the correct starting sequence has been used | Refer <i>Turning the lights on and off</i> . |
| | | Check if the lamp module is correctly inserted in the side of the lamphouse. | Ensure the module clicks positively into place. |
| | | Check if the cable is connected to the socket at the top of the pillar | If not, connect it. |
| | | In the event that the cause cannot be determined, make as many notes as possible about the symptoms and events leading up to the loss of light. | Contact your distributor, local service agent or Scan Optics. |
| POWER SUPPLY | There is no power | Check the mains power supply | Use battery power if no mains power is available. |
| | | Check the circuit breakers on the front panel | Wait a few minutes then press the circuit breaker in to re-set it. |
| | Circuit breakers continually triggered | | Contact your distributor, local service agent or Scan Optics. |
| MOUNTING SYSTEM | The microscope is falling under its own weight | Loosen the arm friction handle and observe if the pantograph arm offers any significant resistance to downward pressure | If it does not then the gas spring may have failed. Contact your distributor, local service agent or Scan Optics. |
| | | Locate the gas spring adjustment near the elbow joint between the arms. | Adjust the gas spring to compensate for additional load on the end of the microscope arm - refer <i>Gas spring adjustment</i> |

| SYMPTOM | FIRST STEP | REMEDY |
|------------------------|--|--|
| MOUNTING SYSTEM | The microscope is falling under its own weight | If the microscope head is falling down its own focus system, you will need to adjust the focus friction. |
| | The microscope is not stable | Check that the microscope is securely clamped to a stable horizontal surface |
| | | Use the optional Scan Optics SO-291 table plate to stiffen a thin mounting surface such as a sheet-metal table or trolley. |
| | | Check that the appropriate friction knobs have been set correctly |
| | | Refer <i>Assembling the arm and head</i> |

SPECIFICATIONS

| OPTICAL HEAD | |
|-------------------------|---|
| VIEWING SYSTEM | Binocular, stereoscopic (convergence angle 10°) |
| | Eyepiece tube inclination 45° |
| MAGNIFICATION | Zoom magnification, range 4.2 x - 25x |
| WORKING DISTANCE | Auxiliary objective to object distance 180 mm |
| FIELD OF VIEW | 15 - 65mm, depending on magnification |
| REFRACTIVE ERROR | +/- 5D left eyepiece |
| FOCUSING | Range ± 25mm |
| INTERPUPILLARY DISTANCE | Adjustable for Distance PD range approximately 50 to 80mm |
| ILLUMINATION | |
| ALIGNMENT | |
| <i>Main light</i> | Coaxial with viewing system, high intensity |
| <i>Auxiliary light</i> | Non coaxial, high intensity |
| LAMP | |
| <i>Main light</i> | 12V 50W quartz-halogen lamp |
| <i>Auxiliary light</i> | 12V 20W quartz halogen with dichroic reflector |
| FILTERS | |
| <i>Main light</i> | Internal ultraviolet and infrared filters |
| <i>Auxiliary light</i> | Detachable ultraviolet and infrared filter |
| LAMP LIFE | |
| <i>Main light</i> | 20 hours at highest intensity |
| | 80 hours at medium intensity |
| <i>Auxiliary light</i> | 350 hours at highest intensity |
| | 2,000 hours at medium intensity |
| ILLUMINATION | |
| <i>Main light</i> | 75,000 Lux minimum at maximum setting* |
| <i>Auxiliary light</i> | 40,000 Lux minimum at maximum setting* |
| | * with a new lamp |
| MAIN LAMP CHANGE | |
| | Plug in for fast change, no screws |
| POWER SUPPLY | |
| MAINS POWER | 90-260V ac, 47-440Hz universal input. |
| OUTPUT | Regulated output with soft start |
| INTENSITY CONTROL | 5 step |
| EARTHING | Via earth lead of power cable (green/yellow) |
| DIRECT CURRENT | 12 V dc source optional, automatically selected if mains voltage falls by 20% |
| CIRCUIT BREAKERS | External resettable circuit breakers on mains and low voltage circuits |
| CABLES | |
| <i>Mains</i> | Length 5 metres |
| <i>Battery</i> | Length 5 metres |

| MOUNTING SYSTEM | |
|------------------------------------|---|
| CLAMP | Throat 70 mm |
| HEAD TILT | +5° to -45° |
| VERTICAL TENSION | Adjustable gas spring to set lifting force |
| DIMENSIONS | Vertical pillar to head optical axis maximum 930 mm (37") |
| | Pantograph arm vertical range 320 mm (13") |
| MATERIALS | No ferrous metals, preventing corrosion. |
| FOOT CONTROLS | |
| FUNCTIONS | Zoom control, focus control, light intensity control |
| | Adjustable speed |
| SWITCHES | IP67 rated (full immersion) sealed switches |
| CASE | |
| DIMENSIONS | 760 x 530 x 300 mm (30 x 21 x 12") |
| WEIGHT | |
| Microscope packed with accessories | 26 kg (70.5 lbs) (Including packing carton) |
| Floor stand packed | 50 kg (99lbs) (Including packing carton) |

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